Extrapolation and Control Functions

Applied Microeconomics

Hans-Martin von Gaudecker & Florian Zimmermann

Where we stand

- Roy model with MTRs:

$$E[Y(S=0,\omega)|U=u] = m_0(u)$$
$$E[Y(S=1,\omega)|U=u] = m_1(u)$$

- MTE framework:

$$MTE(u) = m_1(u) - m_0(u)$$

- Equivalence of LATE^{IV} and LATE^{CF} for many parametrisations of $m_s(u)$
- What happens beyond the effects for compliers?

Extrapolation

- What is the effect of treatment for individuals whose value of U implies that we will only see them in either treatment or control, regardless of the value Z takes on?
- Functional form assumptions
- Bounds

Parametric control functions

- Heckman selection model is the classic example:

$$m_s(u) = \alpha_s + \gamma_s \cdot \Phi^{-1}(u)$$

- Polynomial u:

$$m_s(u) = \alpha_s + \sum_{j=1}^{J} \gamma_s^j \cdot u^j$$

- ... and many more
- Could add covariates

Standard debates

- Credibility outside the range of observed $P(z)$?
- Any grounds for functional form / distributional assumptions?
- For sure: Can plot, can argue about economics!